

3. (Withdrawn) The polymer of claim 2, wherein the di-n-alkylamine is di-n-dodecylamine.

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4. (Withdrawn) The polymer of claim 1, wherein the hydrophilic polymer backbone is a homopolymer or copolymer based on monomers selected from acrylic acid, methacrylic acid, or any other alkyl derivatives substituted in the B position of the acrylic acid or esters of these acids obtained with mon- or polyalkyleneglycols, acrylamide, methacrylamide, vinylpyrrolidone, itaconic acid, maleic acid, 2-acrylamido-4-sulfonic acid (AMPS) or vinyl sulfonic acid.

5. (Withdrawn) The polymer of claim 4, wherein the hydrophilic backbone is a sodium polyacrylate.

6. (Withdrawn) The polymer of claim 5, wherein the mass average molecular mass of the sodium polyacrylate is in the range 50,000 to 2,000,000, preferably in the range 100,000 to 1,500,000.

7. (Withdrawn) The polymer of claim 4, wherein the hydrophilic backbone is a statistical copolymer of an acrylate and 2-acrylamido-2-methylpropanesulfonic acid (AMPS).

8. (Withdrawn) The polymer of claim 7, wherein said statistical copolymer comprises in the range 30 mole % to 70 mole % of AMPS per mole of acrylate.

9. (Withdrawn) The polymer of claim 1, wherein the effective degree of modification of the polymer is in the range 0.10 to 0.50 moles of n-alkylamine per mole of hydrophilic polymer.

10. (Withdrawn) The use of the polymer of claim 1 in stabilizing emulsions.

11. (Withdrawn) The use of the polymer of claim 1, in stabilizing petroleum or analogous drilling fluids.

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12. (Withdrawn) The use of claim 11 wherein the petroleum or analogous drilling fluids are selected from drilling fluids, fracturing fluids, acidizing fluids or completion fluids.

13. (Currently Amended) An invert emulsion composition comprising an oleaginous fluid, wherein the oleaginous fluid forms the continuous phase of the invert emulsion,

a non-oleaginous fluid, wherein the non-oleaginous fluid forms the discontinuous phase of the invert emulsion, and

a polymeric surfactant, wherein the polymeric surfactant is a polyelectrolyte which has a hydrophilic backbone that has been ~~amidified~~ modified by n-alkylamines in which the alkyl chains contain 6 to 22 carbons, and wherein the polymeric surfactant is in amounts sufficient to form an emulsion.

14. (Previously Presented) The composition of claim 13, wherein the hydrophilic polymer backbone is a homopolymer or copolymer based on monomers selected from acrylic acid, methacrylic acid, or any other alkyl derivatives substituted in the B position of the acrylic acid or esters of these acids obtained with mon- or polyalkyleneglycols, acrylamide, methacrylamide, vinylpyrrolidone, itaconic acid, maleic acid, 2-acrylamido-4-sulfonic acid (AMPS) or vinyl sulfonic acid.

15. (Previously Presented) The composition of claim 13, wherein the hydrophilic polymer backbone is a sodium polyacrylate.

16. (Previously Presented) The composition of claim 15, wherein the mass average molecular mass of the sodium polyacrylate is in the range 50,000 to 2,000,000.

17. (Previously Presented) The composition of claim 15, wherein the mass average molecular mass of the sodium polyacrylate is in the range 100,000 to 1,500,000.

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18. (Previously Presented) The composition of claim 13, wherein the hydrophilic backbone is a statistical copolymer of an acrylate and 2-acrylamido-2-methylpropanesulfonic acid.

19. (Previously Presented) The composition of claim 13, wherein n-alkylamine is a di-n-alkylamine.

20. (Previously Presented) The composition of claim 13, wherein the n-alkylamine is di-n-dodecylamine

21. (Currently Amended) The composition of claim 13, wherein the effective degree of modification of the polymer is in the range 0.10 to 0.50 moles of n-alkylamine per mole of hydrophilic monomer that compose the hydrophilic polymer backbone.

22. (Currently Amended) The composition of claim 13, wherein the ~~emulsion is an invert emulsion~~ the polymeric surfactant is a water-insoluble polymer formed from polyacrylic acid of mass average molecular weight 125,000, or the sodium or other salt of it, that has been grafted with di-n-dodecylamine\* to a degree of 0.35 moles of di-dodecylamine per mole of acrylic acid in the polymer.

23. (Withdrawn) A method of formulating an invert emulsion drilling fluid, said method comprising:

mixing an oleaginous fluid, a non-oleaginous fluid, and a polymeric surfactant, wherein the polymeric surfactant is a polyelectrolyte having a hydrophilic backbone which has been amidified by n-alkylamines in which the alkyl chains contain 6 to 22 carbons, and wherein the polymeric surfactant is in amounts sufficient to form an emulsion.

24. (Withdrawn) The method of claim 23, wherein the hydrophilic polymer backbone is a homopolymer or copolymer based on monomers selected from acrylic acid, methacrylic acid, or any other alkyl derivatives substituted in the B position of the acrylic acid or esters of these acids obtained with mon- or polyalkyleneglycols, acrylamide, methacrylamide, vinylpyrrolidone, itaconic acid, maleic acid, 2-acrylamido-4-sulfonic acid (AMPS) or vinyl sulfonic acid.

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25. (Withdrawn) The method of claim 23, wherein the hydrophilic polymer backbone is a sodium polyacrylate.

26. (Withdrawn) The method of claim 23, wherein the hydrophilic backbone is a statistical copolymer of an acrylate and 2-acrylamido-2-methylpropanesulfonic acid.

27. (Withdrawn) The method of claim 23, wherein n-alkylamine is a di-n-alkylamine.

28. (Withdrawn) The method of claim 23, wherein the n-alkylamine is di-n-dodecylamine

29. (Withdrawn) The method of claim 23, wherein the effective degree of modification of the polymer is in the range 0.10 to 0.50 moles of n-alkylamine per mole of hydrophilic polymer.

30. (Withdrawn) The method of claim 23, wherein the emulsion is an invert emulsion.

31. (Withdrawn) The method of claim 23, wherein the emulsion is a regular emulsion.

32. (Withdrawn) A method of drilling a subterranean well with a drilling fluid, said method comprising:

mixing an oleaginous fluid, a non-oleaginous fluid, and a polymeric surfactant, wherein the polymeric surfactant is a polyelectrolyte having a hydrophilic backbone which has been amidified by n-alkylamines in which the alkyl chains contain 6 to 22 carbons, and wherein

the hydrophilic polymeric surfactant is in amounts sufficient to form an invert emulsion in which the oleaginous fluid is the continuous phase and the non-oleaginous fluid is the discontinuous phase,

circulating said invert emulsion within said subterranean well and  
drilling said subterranean well using said invert emulsion as the drilling fluid.

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33. (Withdrawn) The method of claim 32, wherein the hydrophilic polymer backbone is a homopolymer or copolymer based on monomers selected from acrylic acid, methacrylic acid, or any other alkyl derivatives substituted in the B position of the acrylic acid or esters of these acids obtained with mon- or polyalkyleneglycols, acrylamide, methacrylamide, vinylpyrrolidone, itaconic acid, maleic acid, 2-acrylamido-4-sulfonic acid (AMPS) or vinyl sulfonic acid.

34. (Withdrawn) The method of claim 32, wherein the hydrophilic polymer backbone is a sodium polyacrylate.

35. (Withdrawn) The method of claim 32, wherein the hydrophilic backbone is a statistical copolymer of an acrylate and 2-acrylamido-2-methylpropanesulfonic acid.

36. (Withdrawn) The method of claim 32, wherein n-alkylamine is a di-n-alkylamine.

37. (Withdrawn) The method of claim 32, wherein the n-alkylamine is di-n-dodecylamine

38. (Withdrawn) The method of claim 32, wherein the effective degree of modification of the polymer is in the range 0.10 to 0.50 moles of n-alkylamine per mole of hydrophilic polymer.

39. (Withdrawn) The method of claim 32, wherein the emulsion is an invert emulsion.

40. (Withdrawn) The method of claim 32, wherein the emulsion is a regular emulsion.